E. E. WHITMORE.

CURTAIN ROLLER.

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1,147,834. Patented July 27, 1915.

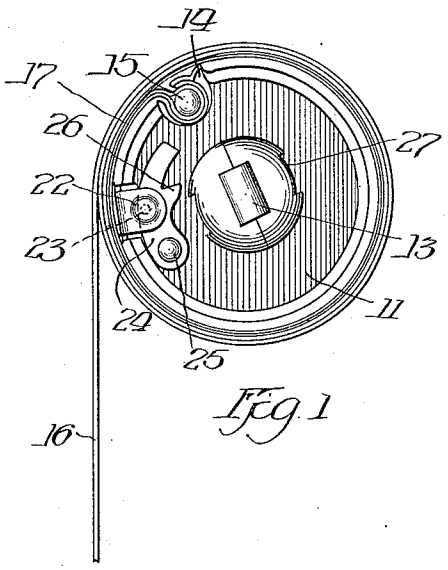


Fig. 1

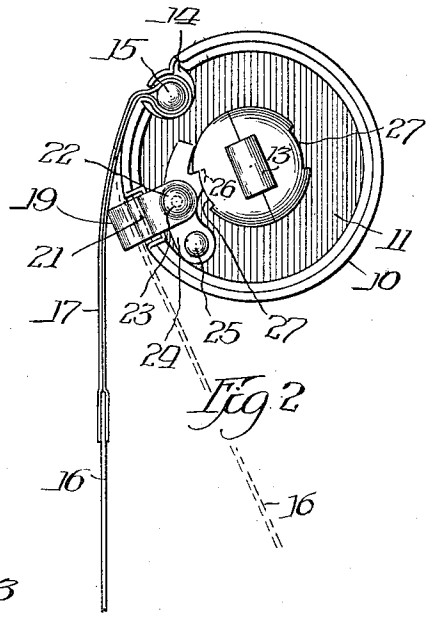


Fig. 2

Fig. 3

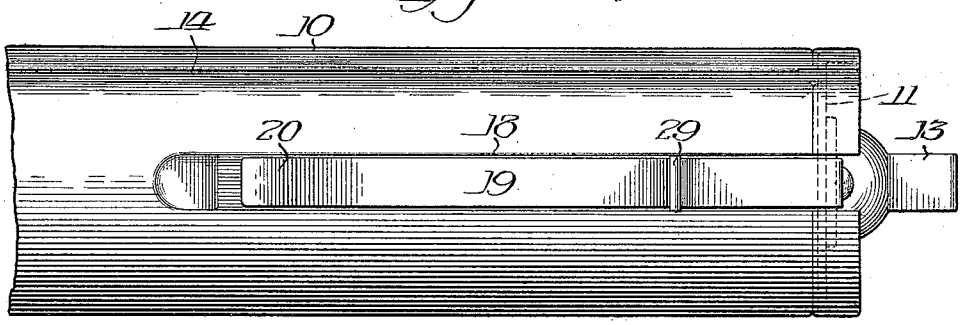
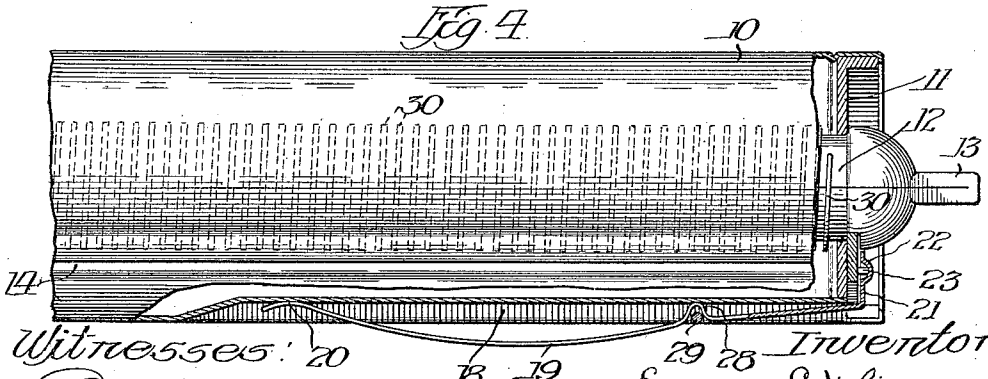


Fig. 4



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UNITED STATES PATENT OFFICE.

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CURTAIN-ROLLER.

1,147,834. Specification of Letters Patent. Patented July 27, 1915.

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To all whom it may concern:

Be it known that I, EDWARD E. WHITMORE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Curtain-Rollers, of which the following is a specification.

Curtain rollers as ordinarily constructed, have a shaft or mandrel with a flattened or spear end adapted to fit in a supporting-bracket and to be held by the latter against rotation. On such mandrel it has been usual to revolubly mount a barrel or hollow-roller, the two parts being connected together by a torsion coil-spring, the barrel or roller being the part on which the curtain is adapted to be rolled up and from which it is unrolled as conditions require. With most curtain-rollers, and particularly with those styles of curtains such as are frequently employed in passenger cars, where the lower edge of the curtain is provided with releasable means traveling in and engaging the walls of grooves in the window-casing and adapted to hold the curtain in adjusted position, it is necessary to have the spring of the roller wound up when the latter is inserted in its supporting-brackets. In order to prevent the roller from unwinding under the influence of its strained spring during such installation of the device in its brackets, it has been usual to aperture the end-portion of the hollow mandrel to provide one or more shoulders or catches for co-action with a pawl pivoted on the barrel or roller proper. After the spring had been wound up or put under torsional strain by turning the barrel relatively to the mandrel preliminary to installation, the pawl was pushed in to cause it to engage the shoulder of the mandrel, and by reason of the shape of the pawl tooth and the action of the spring, the barrel and mandrel were thus locked together, permitting placing of the roller in the brackets without danger of the spring rapidly unwinding and rendering it useless in such condition to wind up the curtain on the roller. Rollers of this character depend upon the weight of the pawl or centrifugal force to hold it retracted from the mandrel shoulder when once released therefrom, otherwise the roller refuses to revolve when it is desired to raise the curtain. If the mandrel has only one aperture and is inserted in its bracket with such aperture or shoulder down, there is practically no danger of the pawl or dog accidentally engaging it when not desired, but as workmen are careless, and the installation of these curtain rollers in the narrow, though rather deep obscure cavities or spaces in the walls of railway cars is attended with some difficulty, not infrequently the rollers are put in place with the mandrel aperture or shoulder up. Under these improper conditions the pawl sometimes catches on the mandrel shoulder, locking the parts together, when in reality the barrel should be free to turn on the mandrel under the influence of its wound-up spring, with the obvious exasperating result that the roller will not wind up the curtain. Even if the roller is properly installed and it becomes desirable to remove it from its brackets, as for example, to replace a damaged curtain with a new one, it is first necessary to lock the barrel and mandrel together by the pawl by causing the latter to engage the mandrel-shoulder and this is difficult of accomplishment because of the inaccessibility of the roller housed in the car-body wall. If it is attempted to remove the roller without such preliminary locking of the parts together, then, just as soon as the spear-end of the mandrel is freed from its bracket the mandrel is at once subjected to the entire stored-up rotative energy of the wound spring, and the latter immediately entirely unwinds, accompanied with the extremely rapid, useless rotation of the mandrel.

The leading object of this invention is the overcoming of the indicated defects of such constructions, and in its preferred embodiment as detailed in this specification the action of the pawl or catch is controlled by the curtain proper. That is to say, the operator by manipulation of the curtain determines whether the catch shall or shall not engage the mandrel shoulder to lock the parts together.

In order that a full and complete explanation of the invention may be had by those skilled in the art, I have illustrated a desirable embodiment of the same in the accompanying drawing forming a part of this specification.

In this drawing: Figure 1 is an end view of a roller equipped with this improvement, showing the pawl retracted; Fig. 2 is a similar view showing the barrel and man-

drel locked together by the pawl; Fig. 3 is a fragmentary face view of the end-portion of the roller with the curtain removed, and Fig. 4 is a partial elevation and partial section, illustrating the construction of parts more in detail.

As is illustrated, the roller comprises a cylindrical sheet-metal barrel or shell 10, having fixed in one end thereof a closure or end-member 11 having a bearing on a mandrel 12 equipped with a flattened or spear-end 13 adapted to be held non-rotatably in a supporting-bracket of the usual type, not illustrated. As is customary, the roller has a longitudinal recess 14 in which by means of a pin or rod 15 the end of the curtain 16 or its attachment-member 17 is fastened.

The sheet-metal shell or barrel is depressed at 18 to provide a lengthwise recess or cavity accommodating a bowed leaf-spring 19, one end of which 20 bears on the bottom of the recess, the other end 21 being bent inwardly of the roller outside of the member 11 and having the cup-shaped recess 22 accommodating a pin 23 on a pawl 24 pivoted to the end-member 11 at 25 and equipped with an undercut-tooth 26 adapted to fit in either one of the apertures 27 of the mandrel and co-act with the shoulder of the latter provided at the margin of the aperture. Intermediate its ends the spring 19 is supplied with a U-shaped inward-bend 28 bearing on the bottom of the recess 18 and receiving a cross-pin 29 fastened to the roller and preventing displacement of the spring.

When the spring is permitted to bow outwardly, as shown in Figs. 2 and 4, then its end 22 pushes the pawl 24 inwardly toward the mandrel, but when the bowed portion of the spring is flattened out, as shown in Fig. 1, the spring rocks somewhat on the part 28 and its end 22 tends to retract the pawl from the mandrel.

The operation of this construction is substantially as follows: Before the curtain is attached to the roller, that is, while the spring 19 is free to bow outwardly, as shown in Fig. 4, the mandrel, by means of a wrench applied to its flattened or spear end, is rotated while the roller is retained stationary so that the coil-spring 30 is wound up. During such turning of the mandrel the pawl readily rides over the shoulders provided in the mandrel by the presenee of the apertures, and when the spring has been wound sufficiently the pawl or dog by entering one of the apertures 27 and engaging the corresponding shoulder of the mandrel, prevents the spring from unwinding. Then the curtain may be readily attached to the roller in the usual manner by means of the pin or rod 15 in the cavity 14, or the curtain may be fastened to the roller before the mandrel is wound up, provided that during the winding of the torsion spring the leaf spring 19 is permitted to bow, as shown in Figs. 2 and 4, so that the pawl may automatically prevent the mandrel from unwinding. Then the roller and curtain are installed in the supporting brackets, the flattened or spear end 13 being held in its bracket against rotation, as is customary. As soon as the curtain is pulled so as to rotate the barrel relatively to the mandrel and the curtain at the same time bears on the bowed portion of the spring 19 to flatten it, then the leaf-spring will retract the pawl, as shown in Fig. 1 and maintain it retracted as long as the leaf-spring is maintained flattened by the curtain. It should be understood that even though the curtain holds the spring 19 flat, the pawl will not be released from the mandrel until the barrel is turned sufficiently to let the pawl respond to the retracting influence of the leaf-spring, because when the parts are locked together so that the torsion spring is causing the mandrel to grip the pawl, the latter cannot move away owing to the stronger pressure exerted by the torsion-spring. The pawl having once been retracted is held in this condition during the usual raising and lowering of the curtain, the torsion spring always tending to wind up the curtain, which influence is resisted by the curtain restraining devices at the lower edge of the curtain, not illustrated. If it is desired to remove the roller and curtain from the brackets, it is merely necessary to pull the curtain down an abnormal amount so as to totally unwind it and its terminal fastening-strip 17 from the roller. Such movement permits the formerly strained leaf-spring to again become bowed or arched, thereby pushing the pawl inwardly toward the mandrel and causing the tooth to engage the shoulder of the mandrel. This locks the barrel and mandrel together so that they may be removed from the supporting-brackets without having the torsion spring unwind. If a new curtain is to be substituted for the old one this can be readily accomplished and the roller again placed in the brackets. Then by pulling the curtain in the direction indicated by the dotted lines in Fig. 2 so as to flatten the leaf-spring and rotate the barrel slightly, the rotation will release the pawl from the mandrel and the flattened leaf-spring will cause its retraction so that the two parts will no longer be locked together, but the barrel will be under the winding influence of the internal spring ready to perform its normal functions as illustrated in Fig. 1. In other words, the locking of the barrel and mandrel together and their unlocking is accomplished by manipulation of the curtain proper, the curtain being employed not only for turning the barrel to unlock the pawl, but also to flatten out the bowed leaf-spring when required.

Herein I have described a preferred em-

bodiment of this invention, but it is susceptible of incorporation in constructions having quite radical differences in structure, and I do not care, therefore, to be confined to the exact and precise structural details illustrated and described.

I claim:

1. In a curtain-roller construction, the combination of a mandrel, a barrel revolubly mounted thereon, a spring associated with said mandrel and barrel and when under tension tending to rotate one relatively to the other, a pawl pivoted on said barrel and adapted to engage a shoulder on said mandrel to lock the barrel and mandrel against relative rotation under the influence of said spring, and a bowed leaf spring mounted on the barrel and normally flattened by the curtain wound on the barrel, said leaf-spring coöperating with said pawl and tending by its resiliency when bowed to press the latter into co-active relation with the mandrel shoulder and when flattened tending by its resiliency to hold the pawl retracted from the mandrel-shoulder whereby the barrel is free to revolve under the action of its rotating-spring, substantially as described.

2. In a curtain-roller construction, the combination of a mandrel, a barrel revolubly mounted thereon, a spring associated with said mandrel and barrel and when under strain tending to rotate one relatively to the other, a pawl pivoted on said barrel and adapted to engage a shoulder on the mandrel to lock the barrel and mandrel against relative rotation under the influence of said spring, and a bowed leaf-spring accommodated in a recess of the barrel and normally flattened and covered by a curtain wound on the barrel, said leaf-spring coöperating with said pawl and tending by its resiliency when bowed to press the latter into co-active relation with the mandrel-shoulder, and when flattened tending by its resiliency to hold the pawl retracted from the mandrel shoulder whereby the barrel will be free to revolve under the action of its rotating-spring, substantially as described.

3. In a curtain-roller construction, the combination of a shouldered mandrel, a barrel revolubly mounted thereon, a spring associated with said mandrel and barrel and when under strain tending to rotate one relatively to the other, a lock carried by the barrel and adapted to engage the mandrel-shoulder to lock the barrel and mandrel against relative rotation under the influence of said spring, a normally-bowed leaf spring provided with a fulcrum between its ends bearing on said barrel, an end of said spring when the spring is bowed pressing the lock inwardly toward the mandrel-shoulder, and means to straighten the spring, such spring end when the spring is straightened tending to pull the lock outwardly away from the mandrel-shoulder, substantially as described.

4. In a curtain-roller construction, the combination of a shouldered mandrel, a barrel revolubly mounted thereon, a spring associated with said mandrel and barrel and when under strain tending to rotate one relatively to the other, a lock on said barrel adapted to engage the shoulder of said mandrel to lock the barrel and mandrel against relative rotation under the influence of said spring, a normally-bowed leaf spring accommodated in a recess of said barrel, said spring having a bent part forming a fulcrum bearing on the bottom of the barrel-recess, an end of said spring when the latter is bowed pressing the lock inwardly toward the mandrel-shoulder, and means to straighten the spring, said spring end when the spring is straightened tending to pull the lock outwardly away from the mandrel-shoulder, substantially as described.

5. In a curtain-roller construction, the combination of a shouldered mandrel, a barrel revolubly mounted thereon, a spring associated with said mandrel and barrel and when under strain tending to rotate one relatively to the other, a pawl pivoted on the barrel and adapted to engage the shoulder on the mandrel to lock the barrel and mandrel against relative rotation under the influence of said spring, a bowed leaf spring accommodated in a recess of the barrel and normally covered by the curtain wound on the barrel, said leaf spring coöperating with the pawl and when bowed tending to press the pawl into coacting relation with the mandrel-shoulder, the protruding bowed portion of the spring being adapted to be flattened by the curtain attached to the barrel and when so flattened tending to cause an end of the spring to hold the pawl retracted from the mandrel-shoulder, whereby the barrel is free to revolve under the action of its rotating spring, said leaf spring being bent between its ends to form a fulcrum bearing on the barrel, whereby the bowing and flattening of the spring causes its end connected to the pawl to yieldingly act in opposite directions, substantially as described.

6. In a curtain-roller construction, the combination of a shouldered-mandrel, a barrel revolubly mounted thereon, a spring associated with said mandrel and barrel and when under strain tending to rotate one relatively to the other, a lock carried by the barrel and adapted to engage the mandrel-shoulder to lock the barrel and mandrel against relative rotation under the influence of said spring, a normally bowed leaf-spring mounted on the barrel and provided with a fulcrum between its ends bearing on the barrel, said spring having an inturned end pressing the lock inwardly toward the man-

drel-shoulder when the spring is bowed, and means to flatten the spring, such spring-end when the spring is flattened tending to pull the lock outwardly away from the mandrel-shoulder, substantially as described.

7. In a curtain-roller construction, the combination of a mandrel, a barrel revolubly mounted thereon, a spring associated with said mandrel and barrel and when under strain tending to rotate the barrel relatively to the mandrel, a lock adapted to prevent the barrel from rotating under the influence of said spring, and a second spring under the control of the curtain of the roller and adapted by its resiliency to yieldingly press the lock into operative position or alternately by its resiliency to tend to yieldingly press the lock into inoperative position, substantially as described.

8. In a curtain-roller construction, the combination of a mandrel, a barrel revolubly mounted thereon, a spring associated with said mandrel and barrel and when under strain tending to rotate the barrel relatively to the mandrel, a lock adapted to prevent the barrel from rotating under the influence of said spring, a second spring associated with said lock, and means coöperating with said spring and adapted to reverse its resilient action on the lock, whereby said second spring may press the lock yieldingly into operative position or yieldingly press it into inoperative position, substantially as described.

9. In a curtain-roller construction, the combination of a mandrel, a barrel revolubly mounted thereon, a spring associated with said barrel and mandrel and adapted to rotate the barrel on the mandrel, a locking-means under the control of a curtain associated with the barrel and arranged when the curtain is sufficiently unwound from the barrel to lock the latter against a curtain winding-up rotation, and, when the locking means is pressed by the curtain and the barrel given a further unwinding movement, to unlock the barrel, permitting the latter to wind up the curtain thereon, substantially as described.

10. In a curtain-roller construction, the combination of a mandrel, a barrel revolubly mounted thereon, a spring associated with the mandrel and barrel tending to rotate the barrel on the mandrel, a spring-controlled locking-means carried by the barrel and under the control of a curtain associated with the barrel and arranged, when the curtain is sufficiently unwound from the barrel, to lock the barrel against a curtain winding-up rotation, and, when the locking means is pressed by the curtain, and the barrel given a further unwinding movement, to unlock the barrel, permitting the latter to wind up the curtain thereon, substantially as described.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EDW. E. WHITMORE.

Witnesses:
WALTER M. FULLER,
ALVAREZ A. BARNES.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."